

**WHAT IS CLAIMED IS:**

1. An isolated antimicrobial peptide comprising the amino acid sequence:

5 KNLRRRIIRKIIHIIKKYG-NH<sub>2</sub> (SEQ ID NO: 1),  
KNIRRIIRKIIHIIKKYG-NH<sub>2</sub> (SEQ ID NO: 6),  
KNIRRIIRKIIHIIKKYG (SEQ ID NO: 7),  
KNLRRRIIRKIIHIIKKYG (SEQ ID NO: 8),  
NLRRIIRKIIHIIKKY (SEQ ID NO 9),  
10 NIRRIIRKIIHIIKKY (SEQ ID NO: 10),  
LRRRIIRKIIHIIKK-NH<sub>2</sub> (SEQ ID NO: 11),  
LRRRIIRKIIHIIKK (SEQ ID NO: 12),  
IRRIIRKIIHIIKK-NH<sub>2</sub> (SEQ ID NO: 13),  
IRRIIRKIIHIIKK (SEQ ID NO: 14),  
15 LRRRIIRKIIHIIK-NH<sub>2</sub> (SEQ ID NO: 15),  
RRIIRKIIHIIKK-NH<sub>2</sub> (SEQ ID NO: 16),  
RRIIRKIIHIIK-NH<sub>2</sub> (SEQ ID NO: 17),  
GLRKRLRKFRNKIKEKLKKIG (SEQ ID NO: 19),  
KRLRKFRNKIKEKLKKIG (SEQ ID NO: 20),  
20 RKRLRKFRNKIKEKLKKIGQKI (SEQ ID NO: 21),  
LRKFRNKIKEKLKKIGQKI (SEQ ID NO: 22),  
LRKFRNKIKEKLKKIGQKIQG (SEQ ID NO: 23),  
RKFRNKIKEKLKKIG (SEQ ID NO: 24),  
KIKEKLKKIGQKIQG (SEQ ID NO: 25),  
25 KIKEKLKKIGQKIQGLL (SEQ ID NO: 26),  
RGLRRLGRKIAHGVKKYGPTVLRIRIA-NH<sub>2</sub> (SEQ ID NO. 27), or  
KNLRRRIIRKIIHIIKKYGPTILRIIRIIG-NH<sub>2</sub> (SEQ ID NO. 28).

2. A nucleic acid molecule encoding the antimicrobial peptide comprising the amino  
30 acid sequence:

003720" 44.24360

KNLRRIIRKIIHIIKKYG-NH<sub>2</sub> (SEQ ID NO: 1),  
KNIRRIIRKIIHIIKKYG-NH<sub>2</sub> (SEQ ID NO: 6),  
KNIRRIIRKIIHIIKKYG- (SEQ ID NO: 7),  
KNLRRIIRKIIHIIKKYG (SEQ ID NO: 8),  
5 NLRRIIRKIIHIIKKY (SEQ ID NO 9),  
NIRRIIRKIIHIIKKY (SEQ ID NO: 10),  
LRRIRKIIHIIKK-NH<sub>2</sub> (SEQ ID NO: 11),  
LRRIRKIIHIIKK (SEQ ID NO: 12),  
IRRIIRKIIHIIKK-NH<sub>2</sub> (SEQ ID NO: 13),  
10 IRRIIRKIIHIIKK (SEQ ID NO: 14),  
LRRIRKIIHIIK-NH<sub>2</sub> (SEQ ID NO: 15),  
RRIIRKIIHIIKK-NH<sub>2</sub> (SEQ ID NO: 16),  
RRIIRKIIHIIK-NH<sub>2</sub> (SEQ ID NO: 17)  
GLRKRLRKFRNKIKEKLKKIG (SEQ ID NO: 19),  
15 KRLRKFRNKIKEKLKKIG (SEQ ID NO: 20),  
RKRLRKFRNKIKEKLKKIGQKI (SEQ ID NO: 21),  
LRKFRNKIKEKLKKIGQKI (SEQ ID NO: 22),  
LRKFRNKIKEKLKKIGQKIQG (SEQ ID NO: 23),  
RKFRNKIKEKLKKIG (SEQ ID NO: 24),  
20 KIKEKLKKIGQKIQG (SEQ ID NO: 25),  
KIKEKLKKIGQKIQGLL (SEQ ID NO: 26),  
RGLRRLGRKIAHGVKKYGPTVLRRI RIA-NH<sub>2</sub> (SEQ ID NO. 27), or  
KNLRRIIRKIIHIIKKYGPTILRIIRIIG-NH<sub>2</sub> (SEQ ID NO. 28).

3. A pharmaceutical composition wherein said composition comprises the antimicrobial peptide comprising the amino acid sequence:

KNLRRIIRKIIHIIKKYG-NH<sub>2</sub> (SEQ ID NO: 1),  
KNIRRIIRKIIHIIKKYG-NH<sub>2</sub> (SEQ ID NO: 6),  
30 KNIRRIIRKIIHIIKKYG (SEQ ID NO: 7),  
KNLRRIIRKIIHIIKKYG (SEQ ID NO: 8),



NIRRIIRKIIHIKKY (SEQ ID NO: 10),  
 LRRIRKIIHIKK-NH<sub>2</sub> (SEQ ID NO: 11),  
 LRRIRKIIHIKK (SEQ ID NO: 12),  
 IRRIIRKIIHIKK-NH<sub>2</sub> (SEQ ID NO: 13),  
 5 IRRIIRKIIHIKK (SEQ ID NO: 14),  
 LRRIRKIIHIK-NH<sub>2</sub> (SEQ ID NO: 15),  
 RRIIRKIIHIKK-NH<sub>2</sub> (SEQ ID NO: 16),  
 RRIIRKIIHIK-NH<sub>2</sub> (SEQ ID NO: 17),  
 GLRKRLRKFRNKIKEKLKKIG (SEQ ID NO: 19),  
 10 KRLRKFRNKIKEKLKKIG (SEQ ID NO: 20),  
 RKRLRKFRNKIKEKLKKIGQKI (SEQ ID NO: 21),  
 LKFRNKIKEKLKKIGQKI (SEQ ID NO: 22),  
 LKFRNKIKEKLKKIGQKIQG (SEQ ID NO: 23),  
 RKFRNKIKEKLKKIG (SEQ ID NO: 24),  
 15 KIKEKLKKIGQKIQG (SEQ ID NO: 25),  
 KIKEKLKKIGQKIQGLL (SEQ ID NO: 26),  
 RGLRRLGRKIAHGVKKYGPTVLRIRIA-NH<sub>2</sub> (SEQ ID NO. 27), or  
 KNLRRIRKIIHIKKYGPTILRIIRIIG-NH<sub>2</sub> (SEQ ID NO. 28)..

20 5. The method of claim 4, wherein said first antimicrobial peptide is delivered in a pharmaceutical composition, said pharmaceutical composition, including a pharmaceutically acceptable carrier.

25 6. The method of claim 4, further comprising administering a second antimicrobial agent.

7. The method of claim 6, wherein said first antimicrobial peptide is administered before said second antimicrobial agent.

30 8. The method of claim 6, wherein said first antimicrobial peptide and said second antimicrobial agent are administered together.

9. The method of claim 6, wherein said first antimicrobial peptide is administered after said second antimicrobial agent.

5 10. The method of claim 6, wherein said second antimicrobial agent is selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO:18, SEQ ID NO: 19, SEQ ID NO: 20, SEQ ID NO: 21, SEQ ID NO: 22, SEQ ID NO: 23, SEQ ID NO: 24, SEQ ID NO: 25, SEQ ID NO: 26, SEQ ID NO: 27 and SEQ ID NO:28, wherein the second microbial agent is a different than the first  
10 antimicrobial peptide.

11. The method of claim 6, wherein said second antimicrobial agent is selected from the group consisting of a protein synthesis inhibitor, a cell wall growth inhibitor, a cell membrane synthesis inhibitor, a nucleic acid synthesis inhibitor, and a competitive  
15 inhibitor.

12. A method of inhibiting microbial growth in a host, comprising administering to said host a first antimicrobial peptide comprising the amino acid sequence:

20 KNLRRIRKIIHIKKYG-NH<sub>2</sub> (SEQ ID NO: 1) ,  
RGLRRLGRKIAHGVKKYGPTVLRIRIAG (SEQ ID NO: 2),  
KIAHGVKKYGPTVLRIRIAG (SEQ ID NO 3),  
LGRKIAHGVKKYGPTVLRII (SEQ ID NO: 4),  
RGLRRLGRKIAHGVKKYG (SEQ ID NO: 5),  
25 KNIRRIIRKIIHIKKYG-NH<sub>2</sub> (SEQ ID NO: 6),  
KNIRRIIRKIIHIKKYG (SEQ ID NO: 7),  
KNLRRIRKIIHIKKYG (SEQ ID NO: 8),  
NLRRIIRKIIHIKKY (SEQ ID NO 9),  
NIRRIIRKIIHIKKY (SEQ ID NO: 10),  
30 LRRIIRKIIHIKK-NH<sub>2</sub> (SEQ ID NO: 11),  
LRRIIRKIIHIKK (SEQ ID NO: 12),

IRRIIRKIIHIIKK-NH<sub>2</sub> (SEQ ID NO: 13),  
 IRRIIRKIIHIIKK (SEQ ID NO: 14),  
 LRRIRKIIHIIK-NH<sub>2</sub> (SEQ ID NO: 15),  
 RRIIRKIIHIIKK-NH<sub>2</sub> (SEQ ID NO: 16),  
 5 RRIIRKIIHIIK-NH<sub>2</sub> (SEQ ID NO: 17),  
 GLRKRLRKFRNKIKEKLKKIGQKIQGLLPKLAPRTDY (SEQ ID NO: 18),  
 GLRKRLRKFRNKIKEKLKKIG (SEQ ID NO: 19),  
 KRLRKFRNKIKEKLKKIG (SEQ ID NO: 20),  
 RKRLRKFRNKIKEKLKKIGQKI (SEQ ID NO: 21),  
 10 LRKFRNKIKEKLKKIGQKI (SEQ ID NO: 22),  
 LRKFRNKIKEKLKKIGQKIQG (SEQ ID NO: 23),  
 RKFRNKIKEKLKKIG (SEQ ID NO: 24),  
 KIKEKLKKIGQKIQG (SEQ ID NO: 25),  
 KIKEKLKKIGQKIQGLL (SEQ ID NO: 26),  
 15 RGLRRLGRKIAHGVKKYGPTVLRRI RIA-NH<sub>2</sub> (SEQ ID NO. 27), or  
 KNLRRIIRKIIHIIKKYGPTILRIIRIIG-NH<sub>2</sub> (SEQ ID NO. 28).).

13. A method of inhibiting the growth of drug-resistant microbial strains comprising  
 administering to an environment capable of sustaining such growth a first antimicrobial  
 20 peptide comprising the amino acid sequence:

KNLRRIIRKIIHIIKKYG-NH<sub>2</sub> (SEQ ID NO: 1) ,  
 RGLRRLGRKIAHGVKKYGPTVLRRIIRIAG (SEQ ID NO: 2),  
 KIAHGVKKYGPTVLRRIIRIAG (SEQ ID NO 3),  
 25 LGRKIAHGVKKYGPTVLRRII (SEQ ID NO: 4),  
 RGLRRLGRKIAHGVKKYG (SEQ ID NO: 5),  
 KNIRRIIRKIIHIIKKYG-NH<sub>2</sub> (SEQ ID NO:6),  
 KNIRRIIRKIIHIIKKYG (SEQ ID NO: 7),  
 KNLRRIIRKIIHIIKKYG (SEQ ID NO: 8),  
 30 NLRRIRKIIHIIKKY (SEQ ID NO 9),  
 NIRRIIRKIIHIIKKY (SEQ ID NO: 10),



18. The method of ~~claim 15~~, wherein said first antimicrobial peptide is administered after said second antimicrobial agent.

5 19. The method of ~~claim 15~~, wherein said second antimicrobial agent is selected from the group consisting of a protein synthesis inhibitor, a cell wall growth inhibitor, a cell membrane synthesis inhibitor, a nucleic acid synthesis inhibitor, and a competitive inhibitor.

10 20. A method of inhibiting growth of a microbial strain in a host, comprising administering to said host a first antimicrobial peptide comprising the amino acid sequence:

15 KNLRRIIRKIIHIKKYG-NH<sub>2</sub> (SEQ ID NO: 1) ,  
RGLRRLGRKIAHGVKKYGPTVLRRIIRIAG (SEQ ID NO: 2),  
KIAHGVKKYGPTVLRRIIRIAG (SEQ ID NO 3),  
LGRKIAHGVKKYGPTVLRRII (SEQ ID NO: 4),  
RGLRRLGRKIAHGVKKYG (SEQ ID NO: 5),  
20 KNIRRIIRKIIHIKKYG-NH<sub>2</sub> (SEQ ID NO:6),  
KNIRRIIRKIIHIKKYG (SEQ ID NO: 7),  
KNLRRIIRKIIHIKKYG (SEQ ID NO: 8),  
NLRRIIRKIIHIKKY (SEQ ID NO 9),  
NIRRIIRKIIHIKKY (SEQ ID NO: 10),  
LRRRIIRKIIHIKK-NH<sub>2</sub> (SEQ ID NO: 11),  
25 LRRRIIRKIIHIKK (SEQ ID NO: 12),  
IRRIIRKIIHIKK-NH<sub>2</sub> (SEQ ID NO: 13),  
IRRIIRKIIHIKK (SEQ ID NO: 14),  
LRRRIIRKIIHIK-NH<sub>2</sub> (SEQ ID NO: 15),  
RRIIRKIIHIKK-NH<sub>2</sub> (SEQ ID NO: 16),  
30 RRIIRKIIHIK-NH<sub>2</sub> (SEQ ID NO: 17),  
GLRKRLRKFRNKIKEKLLKKIGQKIQGLLPKLAPRTDY (SEQ ID NO: 18),



GLRKRLRKFRNKIKEKLKKIG (SEQ ID NO: 19),  
 KRLRKFRNKIKEKLKKIG (SEQ ID NO: 20),  
 RKRLRKFRNKIKEKLKKIGQKI (SEQ ID NO: 21),  
 LRKFRNKIKEKLKKIGQKI (SEQ ID NO: 22),  
 5 LRKFRNKIKEKLKKIGQKIQG (SEQ ID NO: 23),  
 RKFRNKIKEKLKKIG (SEQ ID NO: 24),  
 KIKEKLKKIGQKIQG (SEQ ID NO: 25),  
 KIKEKLKKIGQKIQGLL (SEQ ID NO: 26),  
 RGLRRLGRKIAHGVKKYGPTVLRIRIA-NH2 (SEQ ID NO. 27), or  
 10 KNLRRIIRKIIHIIKKYGPTILRIIRIIG-NH2 (SEQ ID NO. 28).

21. The method of claim 20, further comprising administering a second antimicrobial agent.
- 15 22. The method of claim 20, wherein said first antimicrobial peptide is administered before said second antimicrobial agent.
23. The method of claim 20, wherein said first antimicrobial peptide and said second antimicrobial agent are administered together.
- 20 24. The method of claim 20, wherein said antimicrobial peptide is administered after said second antimicrobial agent.
- 25 25. The method of claim 20 wherein said antimicrobial agent is selected from the group consisting of a protein synthesis inhibitor, a cell wall growth inhibitor, a cell membrane synthesis inhibitor, a nucleic acid synthesis inhibitor, and a competitive inhibitor.
- 30 26. A kit for use in inhibiting microbial growth in a host comprising first antimicrobial peptide comprising the amino acid sequence:

KNLRRRIIRKIIHIIKKYG-NH<sub>2</sub> (SEQ ID NO: 1) ,  
RGLRRLGRKIAHGVKKYGPTVLRRIIAG (SEQ ID NO: 2),  
KIAHGVKKYGPTVLRRIIAG (SEQ ID NO 3),  
LGRKIAHGVKKYGPTVLRII (SEQ ID NO: 4),  
5 RGLRRLGRKIAHGVKKYG (SEQ ID NO: 5),  
KNIRRIIRKIIHIIKKYG-NH<sub>2</sub> (SEQ ID NO:6),  
KNIRRIIRKIIHIIKKYG (SEQ ID NO: 7),  
KNLRRRIIRKIIHIIKKYG (SEQ ID NO: 8),  
NLRRIIRKIIHIIKKY (SEQ ID NO 9),  
10 NIRRIIRKIIHIIKKY (SEQ ID NO: 10),  
LRRRIIRKIIHIIKK-NH<sub>2</sub> (SEQ ID NO: 11),  
LRRRIIRKIIHIIKK (SEQ ID NO: 12),  
IRRIIRKIIHIIKK-NH<sub>2</sub> (SEQ ID NO: 13),  
IRRIIRKIIHIIKK (SEQ ID NO: 14),  
15 LRRRIIRKIIHIIK-NH<sub>2</sub> (SEQ ID NO: 15),  
RRIIRKIIHIIKK-NH<sub>2</sub> (SEQ ID NO: 16),  
RRIIRKIIHIIK-NH<sub>2</sub> (SEQ ID NO: 17),  
GLRKRLRKFRNKIKEKLKKIGQKIQGLLPKLAPRTDY (SEQ ID NO: 18),  
GLRKRLRKFRNKIKEKLKKIG (SEQ ID NO: 19),  
20 KRLRKFRNKIKEKLKKIG (SEQ ID NO: 20),  
RKRLRKFRNKIKEKLKKIGQKI (SEQ ID NO: 21),  
LRKFRNKIKEKLKKIGQKI (SEQ ID NO: 22),  
LRKFRNKIKEKLKKIGQKIQG (SEQ ID NO: 23),  
RKFRNKIKEKLKKIG (SEQ ID NO: 24),  
25 KIKEKLKKIGQKIQG (SEQ ID NO: 25),  
KIKEKLKKIGQKIQGLL (SEQ ID NO: 26),  
RGLRRLGRKIAHGVKKYGPTVLRRII RIA-NH<sub>2</sub> (SEQ ID NO. 27), or  
KNLRRRIIRKIIHIIKKYGPTILRIIRIIG-NH<sub>2</sub> (SEQ ID NO. 28)

30 in a suitable container.

27. The kit of claim 26, further comprising a second antimicrobial agent.

28. The kit of claim 27, wherein said second antimicrobial agent is selected from the group consisting of a protein synthesis inhibitor, a cell wall growth inhibitor, a cell  
5 membrane synthesis inhibitor, a nucleic acid synthesis inhibitor, and a competitive inhibitor.

29. The method of claim 20, wherein said microbial strain is a bacteria.

10 30. The method of claim 20, wherein said microbial strain is a virus.

31. The method of claim 30, wherein said virus is HIV, HSV or EIAV.

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